

## CLAIMS

What is claimed is:

1. An energy detect with auto pair select system, comprising:

a device that is operable to perform energy detection with auto pair selection;

5 a plurality of wire pairs that is communicatively coupled to the device; and

wherein the device generates a qualified energy by considering an energy associated with  
at least two wire pairs within the plurality of wire pairs;

the device uses the qualified energy to determine whether at least one additional device is  
communicatively coupled to the device via at least one wire pair within the plurality of wire  
10 pairs; and

the device performs auto power down when no device is communicatively coupled to the  
device via the wire pair.

2. The energy detect with auto pair select system of claim 1, wherein the auto power  
15 down comprises a partial auto power down.

3. The energy detect with auto pair select system of claim 1, wherein the device  
performs auto media dependent interface crossover functionality when the wire pair is transposed  
with at least one additional wire pair.

4. The energy detect with auto pair select system of claim 1, wherein the device  
subtracts a link pulse energy from the energy when the device transmits a link pulse to generate

the qualified energy, the link pulse energy is associated with a link pulse that is transmitted from the device.

5. The energy detect with auto pair select system of claim 4, further comprising an

5 OR gate that sums energies on each of the plurality of wire pairs; and

an AND gate that suppresses the link pulse energy from the sum of the energies of each of the plurality of wire pairs.

6. The energy detect with auto pair select system of claim 1, wherein the device uses  
10 the energy of at least one wire pair within the plurality of wire pairs as the qualified energy when the device does not transmit a link pulse.

7. The energy detect with auto pair select system of claim 1, wherein the plurality of  
15 wire pairs comprises at least one of a receive wire pair and a transmit wire pair.

8. The energy detect with auto pair select system of claim 1, further comprising a  
state machine that is operable to determine connectivity of the device with the plurality of wire  
pairs.

20 9. The energy detect with auto pair select system of claim 8, wherein the state  
machine is operable to change an operational state of the device based on whether at least one  
additional device is communicatively coupled to the device via at least one wire pair within the  
plurality of wire pairs.

10. The energy detect with auto pair select system of claim 1, wherein the device performs wake up from a standby state when the device determines that the at least one additional device is communicatively coupled to the device via the wire pair.

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11. An energy detect with auto pair select system, comprising:

a device that is operable to perform energy detection with auto pair selection;

a wire pair that is communicatively coupled to the device; and

wherein the device determines whether the wire pair comprises an energy;

10 the device subtracts a link pulse energy from the energy when the device transmits a link pulse to generate a qualified energy, the link pulse energy is associated with a link pulse that is transmitted from the device;

the device uses the energy as the qualified energy when the device does not transmit a link pulse; and

15 the device uses the qualified energy to determine whether at least one additional device is communicatively coupled to the device via the wire pair.

12. The energy detect with auto pair select system of claim 11, wherein the device performs auto media dependent interface crossover functionality when the wire pair is transposed with at least one additional wire pair.

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13. The energy detect with auto pair select system of claim 12, wherein the device performs the auto media dependent interface after determining whether the at least one additional device is communicatively coupled to the device via the wire pair.

5 14. The energy detect with auto pair select system of claim 11, wherein the device performs auto power down when no device is communicatively coupled to the device via the wire pair.

10 15. The energy detect with auto pair select system of claim 14, wherein the auto power down comprises a partial auto power down.

15 16. The energy detect with auto pair select system of claim 11, wherein the device performs wake up from a standby state when the device determines that the at least one additional device is communicatively coupled to the device via the wire pair.

20 17. The energy detect with auto pair select system of claim 11, wherein the device comprises a state machine that is operable to change an operational state of the device based on whether the at least one additional device is communicatively coupled to the device via the wire pair.

18. The energy detect with auto pair select system of claim 11, further comprising at least one additional wire pair; and

wherein the device sums energy on the wire pair and energy on the at least one additional wire pair.

19. The energy detect with auto pair select system of claim 18, wherein the wire pair  
5 comprises at least one of a transmit pair and a receive pair; and

the at least one additional pair comprises at least one of a transmit pair and a receive pair.

20. An energy detect with auto pair select system, comprising:

a device that is operable to perform energy detection with auto pair selection;

10 a plurality of wire pairs that is communicatively coupled to the device;

a state machine that is operable to determine connectivity of the device; and

15 wherein the device performs auto media dependent interface crossover functionality when  
at least two wire pairs within the plurality of wire pairs are transposed;

the device determines whether at least one wire pair within the wire pair comprises an  
energy;

the device subtracts a link pulse energy from the energy, when the device transmits a link  
pulse, to generate a qualified energy, the link pulse energy is associated with a link pulse that is  
transmitted from the device;

the device uses the energy as the qualified energy when the device does not transmit a  
20 link pulse;

the device provides the qualified energy to the state machine;

the state machine determine whether at least one additional device is communicatively  
coupled to the device via the wire pair; and

the device performs energy savings management.

21. The energy detect with auto pair select system of claim 20, wherein the state machine is contained within the device.

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22. The energy detect with auto pair select system of claim 20, wherein the device is operable within at least one of a standby state and an awake state as determined by the state machine.

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23. The energy detect with auto pair select system of claim 20, wherein the device performs auto power down when the device determines that no device is communicatively coupled to the device via the wire pair.

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24. The energy detect with auto pair select system of claim 20, further comprising an OR gate that sums energies on each of the plurality of wire pairs; and

an AND gate that suppresses the link pulse energy from the sum of the energies of each of the plurality of wire pairs.

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25. An energy detect with auto pair select method, the method comprising:  
performing energy detection of a plurality of wire pairs, at least one wire pair within the plurality of wire pairs is communicatively coupled to a device;  
generating a qualified energy by considering an energy associated with at least two wire pairs within the plurality of wire pairs;

determining whether at least one additional device is communicatively coupled to the device via at least one wire pair within the plurality of wire pairs; and

performing auto power down when no device is communicatively coupled to the device via the wire pair.

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26. The method of claim 25, further comprising performing auto negotiation between the device and at least one additional device.

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27. The method of claim 25, further comprising waking up the device from a standby state.

28. The method of claim 25, wherein the auto power down comprises a partial auto power down.

29. The method of claim 25, further comprising performing auto media dependent interface crossover functionality when the wire pair is transposed with at least one additional wire pair.

30. The method of claim 25, further comprising summing energies on each of the plurality of wire pairs; and

suppressing energy associated with a transmitted link pulse from the sum of the energies of each of the plurality of wire pairs, the transmitted link pulse being transmitted from a device.

31. The method of claim 25, further comprising using the energy of at least one wire pair within the plurality of wire pairs as the qualified energy when the device does not transmit a link pulse.

5 32. The method of claim 25, wherein the plurality of wire pairs comprises at least one of a receive wire pair and a transmit wire pair.

33. The method of claim 25, further comprising employing a state machine to determine connectivity of the device with the plurality of wire pairs.

10 34. The method of claim 33, wherein the state machine is operable to change an operational state of the device based on whether at least one additional device is communicatively coupled to the device via at least one wire pair within the plurality of wire pairs.

15 35. The method of claim 25, wherein the device performs wake up from a standby state when the device determines that the at least one additional device is communicatively coupled to the device via the wire pair.

20 36. An energy detect with auto pair select method, the method comprising:  
performing energy detection with auto pair selection on a device having a wire pair communicatively coupled thereto;  
determining whether the wire pair comprises an energy;



subtracting a link pulse energy from the energy, when the device transmits a link pulse, to generate a qualified energy, the link pulse energy is associated with a link pulse that is transmitted from the device;

using the energy as the qualified energy when the device does not transmit a link pulse;

5 and

using the qualified energy to determine whether at least one additional device is communicatively coupled to the device via the wire pair.

10 37. The method of claim 36, further comprising performing auto media dependent interface crossover functionality when the wire pair is transposed with at least one additional wire pair.

15 38. The method of claim 37, further comprising performing the auto media dependent interface after determining whether the at least one additional device is communicatively coupled to the device via the wire pair.

39. The method of claim 36, further comprising performing auto power down when no device is communicatively coupled to the device via the wire pair.

20 40. The method of claim 39, wherein the auto power down comprises a partial auto power down.

41. The method of claim 36, further comprising waking up the device from a standby state after determining that the at least one additional device is communicatively coupled to the device via the wire pair.

5 42. The method of claim 36, further comprising employing a state machine to change an operational state of the device based on whether the at least one additional device is communicatively coupled to the device via the wire pair.

10 43. The method of claim 36, wherein at least one additional wire pair is communicatively coupled to the device; and

further comprising summing energy on the wire pair and energy on the at least one additional wire pair.

15 44. The method of claim 43, wherein the wire pair comprises at least one of a transmit pair and a receive pair; and

the at least one additional pair comprises at least one of a transmit pair and a receive pair.